CLAIMS

1. A recording system for recording a high definition (HD) video onto a standard definition (SD) compatible medium, comprising:

a system for scaling down the HD video to an SD video format;

a system for encoding the SD video;

a system for extracting enhancement information from the HD video; and

a system for storing the SD video and the extracted enhancement information onto the SD compatible medium.

2. The recording system of claim 1, wherein the SD compatible medium comprises a DVD.

3. The recording system of claim 1, wherein the system for encoding comprises an MPEG-2 encoder.

4. The recording system of claim 1, wherein the enhancement information comprises high frequency image data partitioned into different energy regions.

5. The recording system of claim 4, wherein enhancement information is stored in an energy region map by a feature processing system.

6. The recording system of claim 5, wherein the energy region map is coded using a quadtree decomposition algorithm.

7. The recording system of claim 1, wherein the SD video and the extracted enhancement information are stored at a combined rate of approximately 5 megabits/second.

8. The recording system of claim 1, wherein the extracted enhancement information is stored at a rate of less than 1 megabit/second.

9. The recording system of claim 1, further comprising an aspect ratio format system for formatting the SD video for widescreen, letterboxing, and scan and pan formats.

10. The recording system of claim 1, wherein the SD video can be stored in a format selected from the group consisting of: progressive and interlaced.

11. The recording system of claim 1, wherein the enhancement information is stored in an MPEG userdata field.

12. A playback system for reconstructing a high definition (HD) video image from a standard definition (SD) format recording, comprising:

a system for extracting and decoding SD data from the recording;

a system for extracting enhancement information from the recording;

a system for de-interlacing the decoded SD data; and

a system for up-scaling and post-processing the decoded SD data with the enhancement information to generate the HD video image.

13. The playback system of claim 12, wherein the enhancement information comprises information relating to high frequency image data extracted during a recording process.

14. The playback system of claim 13, wherein the enhancement information comprises an energy region map.

15. The playback system of claim 14, wherein the energy region map is coded with a quadtree decomposition algorithm.

16. The playback system of claim 14, wherein the post-processing system applies adaptive peaking with a gain map derived from the enhancement information.

17. The playback system of claim 14, wherein the post-processing system applies luminance transient improvement with a gain map derived from the enhancement information.

18. A method for recording high definition (HD) video onto a standard definition (SD) compatible medium, comprising:

scaling down the HD video to an SD video format;

encoding the SD video;

generating enhancement information from the HD video; and

storing the SD video and the enhancement information onto the SD compatible medium.

19. The method of claim 18, wherein the step of generating enhancement information includes:

extracting high frequency image data from the HD video; and

creating a energy region map based on the high frequency image data using a quadtree algorithm.

20. The method of claim 18, wherein the enhancement information is stored in an MPEG userdata field.

21. A method of reconstructing a high definition (HD) video image from a standard definition (SD) format recording, comprising:

extracting and decoding SD data from the recording;

extracting enhancement information from the recording;

de-interlacing the decoded SD data; and

up-scaling and post-processing the decoded SD data with the enhancement information to generate the HD video image.

22. The method of claim 21, wherein the enhancement information is stored in an MPEG userdata field and comprises an energy region map coded with a quadtree decomposition algorithm.

23. The method of claim 22, wherein the decoded SD data is post-processed by applying adaptive peaking with a gain map derived from the enhancement information.

24. The method of claim 22, wherein the decoded SD data is post-processed by applying luminance transient improvement with a gain map derived from the enhancement information.

25. A program product stored on a recordable medium for recording high definition (HD) video onto a standard definition (SD) DVD, comprising:

means for scaling down the HD video to an SD format video;

means for encoding the SD video;

means for generating enhancement information from the HD video, wherein the enhancement data comprises high frequency image data; and

means for storing the SD format video and the enhancement information onto the DVD.

26. A program product stored on a recordable medium for reconstructing a high definition (HD) video image from a standard definition (SD) DVD, comprising:

means for extracting and decoding SD data from the DVD;

means for extracting enhancement information from the DVD, wherein the enhancement information is stored in an MPEG userdata field and comprises high frequency image data;

means for de-interlacing the decoded SD data; and

means for up-scaling and post-processing the decoded SD data with the enhancement information to generate the HD video image.

27. The program product of claim 26, wherein the post-processing means applies one of the group consisting of: adaptive peaking and luminance transient improvement, with a gain map derived from the enhancement information.